

# **EXHIBIT B**

## PATENT

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE  
(Case No. 97,008-Y)

In re Application of: )  
 )  
COPELAND, et. al )  
 ) Group Art Unit: Not yet assigned  
Serial No.: Not yet assigned )  
 ) Examiner: Not yet assigned  
Filed: May 2, 2002 )  
 )  
For: Automated Biological )  
Reaction Apparatus )

Commissioner for Patents  
Washington, DC 20231

PRELIMINARY AMENDMENT

Dear Sir:

IN THE SPECIFICATION

Please amend the specification as follows. A marked up version of the amended claims, to show all the changes, is attached hereto on pages separate from the amendment in accordance with 37 CFR 1.121(b).

Please delete lines 3-5 at page 1 and insert the following therefor:

This is a continuation of application Serial No. 09/931,513, filed August 16, 2001, pending, which is a continuation of application Serial No. 09/452,309, filed December 1, 1999, U.S. Patent No. 6,352,861, which is a continuation of application Serial No. 08/906,678, filed August 5, 1997, abandoned, which is a continuation of application Serial No. 08/479,415, filed June 6, 1995, U.S. Patent No. 5,654,200, which is a division of application Serial No. 352,966, filed December 9, 1994, U.S. Patent No. 5,595,707, which is a continuation of application Serial No. 924,052, filed August 31, 1992,

Cont A1

abandoned, which is a continuation-in-part of application Serial No. 488,601, filed March 2, 1990,  
abandoned.

After page 12, line 10, please insert the following paragraph:

A2

FIG. 34 is a schematic of a jet drain for draining liquid from an upper surface of a slide.

At page 41, lines 3-8, please amend the text as follows:

AB

Immunohistological methods for which the apparatus of this invention are particularly suitable are described in concurrently filed, commonly assigned patent application Serial No. 07/488,601, filed March 2, 1990, now abandoned (Attorney Docket No. 193.0007), the entire contents of which are hereby incorporated by reference.

101.37169.050202

IN THE CLAIMS:

Please cancel claims 1-71 without prejudice. Please add the following claims 72-115 as follows.

A marked up version of the amended claims, to show all the changes, is attached hereto on pages separate from the amendment in accordance with 37 CFR 1.121(c)(1)(ii).

72. (New claim) A biological reaction apparatus for dispensing a selected reagent to a slide containing a sample, said biological reaction apparatus comprising:  
a reagent carousel having a plurality of reagent container supports thereon;  
homing and indexing device, operatively coupled to the reagent carousel, for identifying the position of each reagent container support with reference to a home position;  
motor engaging the reagent carousel and operatively coupled to said homing and indexing device, for rotating the reagent carousel and positioning a preselected reagent container support in a reagent supply zone;  
a sample carousel arranged beneath said reagent carousel for cooperation therewith, and having a plurality of slide supports with each slide support engaging a slide having a substantially planar support surface; and  
air mixer positioned adjacent an air agitation zone for mixing reactants when in the air agitation zone,

wherein said reagent supply zone is oriented so that reagent in a container in said preselected reagent container support is dispensable to a slide and wherein each of the reagent container supports is arranged to accommodate a reagent container such that it is positioned above a slide when in the reagent supply zone whereby the reagent is dispensable from a lower end of said container onto a slide.

73. (New claim) The biological reaction apparatus of claim 72, wherein said sample carousel may be arranged to allow said sample supports to be positioned in said reagent supply zone.

74. (New claim) The biological reaction apparatus of claim 72, wherein the reagent carousel is rotatably mounted on a reagent carousel support, and wherein the homing and indexing device further comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the reagent carousel, and the other of the object and said proximity detector being mounted on the reagent carousel support in a position adjacent the path of the other.

75. (New claim) The biological reaction apparatus of claim 74, wherein said object is metallic and mounted on the reagent carousel, and wherein the proximity detector is a metal proximity detector mounted on the reagent carousel support.

76. (New claim) The biological reaction apparatus of claim 75, wherein the reagent carousel is rotatably mounted on a reagent carousel support, the reagent carousel has a bar code zone, and

wherein the homing and indexing device further comprises a bar code reader mounted on the reagent carousel support in a position to read a bar code on a reagent container positioned in the bar code zone, whereby a bar code identifying the contents of a reagent container in the respective reagent container support can be read with reference to said home position by the bar code reader, and the reagent container containing said identified reagent can be automatically positioned in the reagent supply zone.

77. (New claim) The biological reaction apparatus of claim 76, further comprises a reagent delivery actuator positioned for engaging a reagent container positioned in the reagent delivery zone and initiating delivery of a predetermined volume of reagent from the reagent container to said slide.

78. (New claim) The biological reaction apparatus of claim 77, wherein the motor comprises a stepper motor having a rotational mode for rotating the reagent carousel and a braking mode resisting rotation of the reagent carousel.

79. (New claim) The biological reaction apparatus of claim 78, wherein the reagent carousel comprises a reagent support tray removably supported by a reagent tray support, the reagent support tray has indexing support feet on an underside thereof, the reagent tray support has receptors for the indexing support feet in an upper surface thereof, whereby the reagent support tray can be removed from the reagent tray support for reloading or refrigerated storage and can be replaced on the reagent support tray in the same indexed position.

80. (New claim) The biological reaction apparatus of claim 79, wherein each sample support comprises a slide support plate having a distal end, a proximal end and a slide support surface, the distal end having raised terminal and lateral distal guide tabs with guide tab termini, the proximal end having first and second lateral guides with opposed surfaces for engaging the lateral edges of a slide, the distance between the slide support surface and the guide tab termini being less than a microscope slide thickness.

81. (New claim) The biological reaction apparatus of claim 80, wherein the slide support plate comprises a distal support section at the distal end and a proximal support section at the proximal end, the proximal support section comprising an inflexible support and a flexible arm with opposed lateral edges, and the distance between the slide engaging surfaces is less than a microscope slide width, whereby the slide engaging surfaces apply a positive pressure against the edges of a slide engaged therewith.

82. (New claim) The biological reaction apparatus of claim 81, wherein the distance between the slide engaging surfaces is from 20 to 24mm.

83. (New claim) The biological control apparatus of claim 82, further including a pivot support with a pivot axis, wherein the slide support plate is pivotally mounted on the pivot support for rotation around the pivot axis from a horizontal position to a slide draining position.

84. (New claim) The biological reaction apparatus of claim 83, wherein the pivot axis is defined by a pivot rod and a pivot rod receptor in sliding engagement therewith, one of the pivot rod and the pivot rod receptor being attached to or integral with the slide support and the other of the pivot rod and pivot rod receptor being attached to or integral with the pivot support.

85. (New claim) The biological reaction apparatus of claim 84, wherein the pivot axis is defined by two pivot rods and pivot rod receptors.

86. (New claim) The biological reaction apparatus of claim 82, wherein the slide support surface slopes downward from the proximal end to the distal end, the plane of the slide support surface forming an angle with the pivot axis of from 0.3 to 1 degree.

87. (New claim) The biological reaction apparatus of claim 83, wherein the slide support includes a lateral tilt cam surface for engagement by a tilt actuator.

88. (New claim) The biological reaction of claim 83, further comprising a rotational bias means for retaining the support surface in the substantially horizontal position when the tilt cam surface is not engaged by a tilt actuator.

89. (New claim) The biological reaction apparatus of claim 88 characterised in that the rotational bias means is a spring.

90. (New claim) The biological reaction apparatus of claim 83, wherein the pivot support has a pivot stop means positioned to abut a surface of the slide support for stopping pivotal rotation of the slide support when it has been pivoted to the slide draining position.

91. (New claim) The biological reaction apparatus of claim 73, wherein the homing and indexing device is operatively coupled to the slide support carousel, for identifying the position of each said slide support with reference to a home position; and  
wherein the motor, engaging the slide support carousel and operatively coupled to said homing and indexing device, rotates the slide support carousel and positions a slide support in a reagent delivery zone.

92. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,  
wherein the homing and indexing device comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the slide support carousel, and the other of the object and said proximity detector being mounted on the slide carousel support in a position adjacent the path of the other.

93. (New claim) The biological reaction apparatus of claim 93, wherein said object is metallic and mounted on the slide support carousel and the proximity detector is a metal proximity detector mounted on the slide carousel support.

94. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,  
wherein the slide support carousel has a bar code zone, and  
wherein the homing and indexing device comprises a bar code zone, reader mounted on the slide carousel support in a position to read a bar code on a slide positioned in the bar code zone.

95. (New claim) The biological reaction apparatus of claim 91, characterised in that the motor comprises a stepper motor having a rotational mode for rotating the slide support carousel and a braking mode resisting rotation of the slide support carousel.

96. (New claim) The biological reaction apparatus of claim 95, further comprising a heating device for heating the samples.

97. (New claim) The biological reaction apparatus of claim 96, wherein the heating device comprises an air supply chamber communicating with the air distribution manifold, start-up and operational heating means positioned in the path of air passing from the air supply chamber to the air distribution manifold, the start-up heating means comprising means for heating air until the heating chamber has reached an operational temperature, and the operational heating means comprising means for heating air until the heating chamber has reached said operational temperature and for intermittently heating air thereafter to maintain the heating chamber at an operational temperature.

98. (New claim) The biological reaction apparatus of claim 97, wherein the heating device includes a fan positioned to force air into the air distribution manifold through the air supply chamber,



said fan including air temperature responsive means for increasing the rotational speed of said fan when the air temperature entering the air distribution manifold falls below a desired operational temperature.

99. (New claim) The biological reaction apparatus of claim 96, further comprising a temperature sensing device positioned in the path of heated air entering the air distribution manifold for detecting the temperature of said heated air.

100. (New claim) The biological reaction apparatus of claim 99, wherein the temperature sensing device is a thermistor encased in a heat sensitivity reducing jacket.

101. (New claim) The biological reaction apparatus of claim 72, further comprising a rinse station, a rinse solution applicator positioned adjacent the rinse station, the rinse solution applicator comprising at least one nozzle positioned for directing a stream of rinse liquid onto a rinse solution impact zone of a sample support.

102. (New claim) The biological reaction apparatus of claim 72, further comprising an evaporation inhibiting liquid application station, evaporation inhibiting liquid applicator positioned adjacent the application station, the evaporation inhibiting liquid applicator comprising at least one nozzle positioned for directing a stream of evaporation inhibiting liquid onto a preselected evaporation inhibiting liquid impact zone of a sample support.

103. (New claim) An automated biological reaction apparatus of claim 102, wherein the evaporation inhibiting liquid application station is in the reagent delivery zone.

104. (New claim) The biological reaction apparatus of claim 72, wherein the air mixer includes a vortex agitation mixer having a nozzle for directing air at the air agitation zone, said sample support being positionable in the air agitation zone.

105. (New claim) The biological reaction apparatus of claim 104, wherein the vortex agitation mixer comprises a nozzle for applying at least one gas stream to an off-center area of the surface of liquid on a slide in the air agitation zone.

106. (New claim) The biological reaction apparatus of claim 105, wherein the vortex agitation mixer comprises a first nozzle adjacent to a distal end of a slide support in the air agitation zone for directing a first gas stream to a first off-center area of the surface of the liquid on a slide in the air agitation zone, and a second nozzle adjacent to a proximal end of a slide support in the air agitation zone for directing a second gas stream to a second off-center area of the surface of the liquid on a slide in the air agitation zone, the first and second gas streams being in opposite directions and the first and second off-center areas being on opposite sides of the center of the surface of a liquid on a slide in the air agitation zone.

107. (New claim) The biological reaction apparatus of claim 72, further comprising apparatus for providing a sample rinse liquid within a selected temperature range, such apparatus comprising:

a container for receiving liquid;

temperature regulator, operatively mounted on said container, for maintaining liquid in the container within a selected temperature range; and

means, operatively coupled to said container, for delivering liquid at a temperature within said selected temperature range from the container to said sample.

108. (New claim) The biological reaction apparatus of claim 107, further comprising a safety thermostat connected to the heating device for terminating a flow of power to the heating device if the temperature of the container exceeds a predetermined safety limit.

109. (New claim) The biological reaction apparatus of claim 94, further comprising a bar code cleaner for cleaning bar codes on the slides.

110. (New claim) The biological reaction apparatus of claim 108, further comprising draining means for draining rinse solution from a sample.

111. (New claim) The biological reaction apparatus of claim 110, characterised in that the drain means comprises a jet drain for directing a jet of fluid across an upper surface of a slide.

112. (New claim) The biological reaction apparatus of claim 108, wherein the rinse solution applicator comprises a first rinsing means at a beginning of the rinse zone and a second rinsing means at an end of the rinse zone.

113. (New claim) The biological reaction apparatus of claim 112, wherein the first rinsing means includes at least one nozzle for depositing a layer of rinse liquid onto an upper surface of a slide positioned at the beginning of the rinse zone and the second rinsing means includes sweeping means for sweeping the layer of rinse liquid off of the slide when the slide reaches the end of the rinse zone.

114. (New claim) The biological reaction apparatus of claim 113, wherein the first rinsing means and the second rinsing means are spaced from one another so that a predetermined period of time transpires during the transport of the slide between the first and second rinsing means before the layer of rinse liquid is swept off of the slide.

115. (New claim) The biological reaction apparatus of claim 114, wherein the sweeping means of the second rinsing means comprises fluid pulsing means for forming pulsed streams of rinse liquid, alternately directed at one and then an other of longitudinal edges of the slides, to sweep the layer of rinse liquid off of the slide.



Respectfully submitted,

McDonnell Boehnen Hulbert & Berghoff

By: Amir N. Penn  
Amir N. Penn, Reg. No. 40,767  
Attorney for Applicant

DATED: 5/02/02

202050.69T4ETDT

APPENDIX UNDER 37 CFR 1.121(b)

**IN THE SPECIFICATION:**

Please delete lines 3-5 at page 1 and insert the following therefor:

This is a continuation of application Serial No. 09/452,309, filed on December 1, 1999, pending, which is a continuation of application Serial No. 08/906,678, filed August 5, 1997, abandoned, which is a continuation of application Serial No. 08/479,415, filed June 6, 1995, U.S. Patent No. 5,654,200, which is a division of application Serial No. 352,966, filed December 9, 1994, U.S. Patent No. 5,595,707, which is a continuation of application Serial No. 924,052, filed August 31, 1992, abandoned, which is a continuation-in-part of application Serial No. 488,601, filed March 2, 1990, abandoned.

After page 12, line 10, please insert the following paragraph:

FIG. 34 is a schematic of a jet drain for draining liquid from an upper surface of a slide.

At page 41, line 6, change "\_\_\_\_\_, filed March 2, 1990" to --07/488,601, filed March 2, 1990, now abandoned--, such that the sentence reads "Immunohistological methods for which the apparatus of this invention are particularly suitable are described in concurrently filed, commonly assigned patent application Serial No. 07/488,601, filed March 2, 1990, now abandoned (Attorney Docket No. 193.0007), the entire contents of which are hereby incorporated by reference."

APPENDIX UNDER 37 CFR 1.121(c)

**IN THE CLAIMS:**

72. (New claim) A biological reaction apparatus for dispensing a selected reagent to a slide containing a sample, said biological reaction apparatus comprising:

a reagent carousel having a plurality of reagent container supports thereon;

homing and indexing device, operatively coupled to the reagent carousel, for identifying the position of each reagent container support with reference to a home position;

motor engaging the reagent carousel and operatively coupled to said homing and indexing device, for rotating the reagent carousel and positioning a preselected reagent container support in a reagent supply zone;

a sample carousel arranged beneath said reagent carousel for cooperation therewith, and having a plurality of slide supports with each slide support engaging a slide having a substantially planar support surface; and

air mixer positioned adjacent an air agitation zone for mixing reactants when in the air agitation zone,

wherein said reagent supply zone is oriented so that reagent in a container in said preselected reagent container support is dispensable to a slide and wherein each of the reagent container supports is arranged to accommodate a reagent container such that it is positioned above a slide when in the reagent supply zone whereby the reagent is dispensable from a lower end of said container onto a slide.

73. (New claim) The biological reaction apparatus of claim 72, wherein said sample carousel may be arranged to allow said sample supports to be positioned in said reagent supply zone.

74. (New claim) The biological reaction apparatus of claim 72, wherein the reagent carousel is rotatably mounted on a reagent carousel support, and

wherein the homing and indexing device further comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the reagent carousel, and the other of the object and said proximity detector being mounted on the reagent carousel support in a position adjacent the path of the other.

75. (New claim) The biological reaction apparatus of claim 74, wherein said object is metallic and mounted on the reagent carousel, and

wherein the proximity detector is a metal proximity detector mounted on the reagent carousel support.

76. (New claim) The biological reaction apparatus of claim 75, wherein the reagent carousel is rotatably mounted on a reagent carousel support, the reagent carousel has a bar code zone, and

wherein the homing and indexing device further comprises a bar code reader mounted on the reagent carousel support in a position to read a bar code on a reagent container positioned in the bar code zone, whereby a bar code identifying the contents of a reagent container in the respective reagent container support can be read with reference to said home position by the bar code reader, and the

reagent container containing said identified reagent can be automatically positioned in the reagent supply zone.

77. (New claim) The biological reaction apparatus of claim 76, further comprises a reagent delivery actuator positioned for engaging a reagent container positioned in the reagent delivery zone and initiating delivery of a predetermined volume of reagent from the reagent container to said slide.

78. (New claim) The biological reaction apparatus of claim 77, wherein the motor comprises a stepper motor having a rotational mode for rotating the reagent carousel and a braking mode resisting rotation of the reagent carousel.

79. (New claim) The biological reaction apparatus of claim 78, wherein the reagent carousel comprises a reagent support tray removably supported by a reagent tray support, the reagent support tray has indexing support feet on an underside thereof, the reagent tray support has receptors for the indexing support feet in an upper surface thereof, whereby the reagent support tray can be removed from the reagent tray support for reloading or refrigerated storage and can be replaced on the reagent support tray in the same indexed position.

80. (New claim) The biological reaction apparatus of claim 79, wherein each sample support comprises a slide support plate having a distal end, a proximal end and a slide support surface, the distal end having raised terminal and lateral distal guide tabs with guide tab termini, the proximal end having first and second lateral guides with opposed surfaces for engaging the lateral edges of a slide, the distance between the slide support surface and the guide tab termini being less than a microscope slide thickness.

81. (New claim) The biological reaction apparatus of claim 80, wherein the slide support plate comprises a distal support section at the distal end and a proximal support section at the proximal end, the proximal support section comprising an inflexible support and a flexible arm with opposed lateral edges, and the distance between the slide engaging surfaces is less than a microscope slide width, whereby the slide engaging surfaces apply a positive pressure against the edges of a slide engaged therewith.

82. (New claim) The biological reaction apparatus of claim 81, wherein the distance between the slide engaging surfaces is from 20 to 24mm.

83. (New claim) The biological control apparatus of claim 82, further including a pivot support with a pivot axis, wherein the slide support plate is pivotally mounted on the pivot support for rotation around the pivot axis from a horizontal position to a slide draining position.

84. (New claim) The biological reaction apparatus of claim 83, wherein the pivot axis is defined by a pivot rod and a pivot rod receptor in sliding engagement therewith, one of the pivot rod and the pivot rod receptor being attached to or integral with the slide support and the other of the pivot rod and pivot rod receptor being attached to or integral with the pivot support.

85. (New claim) The biological reaction apparatus of claim 84, wherein the pivot axis is defined by two pivot rods and pivot rod receptors.

202050-691271

86. (New claim) The biological reaction apparatus of claim 82, wherein the slide support surface slopes downward from the proximal end to the distal end, the plane of the slide support surface forming an angle with the pivot axis of from 0.3 to 1 degree.

87. (New claim) The biological reaction apparatus of claim 83, wherein the slide support includes a lateral tilt cam surface for engagement by a tilt actuator.

88. (New claim) The biological reaction of claim 83, further comprising a rotational bias means for retaining the support surface in the substantially horizontal position when the tilt cam surface is not engaged by a tilt actuator.

89. (New claim) The biological reaction apparatus of claim 88 characterised in that the rotational bias means is a spring.

90. (New claim) The biological reaction apparatus of claim 83, wherein the pivot support has a pivot stop means positioned to abut a surface of the slide support for stopping pivotal rotation of the slide support when it has been pivoted to the slide draining position.

91. (New claim) The biological reaction apparatus of claim 73, wherein the homing and indexing device is operatively coupled to the slide support carousel, for identifying the position of each said slide support with reference to a home position; and  
wherein the motor, engaging the slide support carousel and operatively coupled to said homing and indexing device, rotates the slide support carousel and positions a slide support in a reagent delivery zone.

92. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,  
wherein the homing and indexing device comprises a proximity detector and an object detectable by the proximity detector when the proximity detector and said object are in close proximity, one of said object and said proximity detector being mounted on the slide support carousel, and the other of the object and said proximity detector being mounted on the slide carousel support in a position adjacent the path of the other.

93. (New claim) The biological reaction apparatus of claim 93, wherein said object is metallic and mounted on the slide support carousel and the proximity detector is a metal proximity detector mounted on the slide carousel support.

94. (New claim) The biological reaction apparatus of claim 91, wherein the slide support carousel is rotatably mounted on a slide carousel support,  
wherein the slide support carousel has a bar code zone, and  
wherein the homing and indexing device comprises a bar code zone, reader mounted on the slide carousel support in a position to read a bar code on a slide positioned in the bar code zone.

95. (New claim) The biological reaction apparatus of claim 91, characterised in that the motor comprises a stepper motor having a rotational mode for rotating the slide support carousel and a braking mode resisting rotation of the slide support carousel.

96. (New claim) The biological reaction apparatus of claim 95, further comprising a heating device for heating the samples.

97. (New claim) The biological reaction apparatus of claim 96, wherein the heating device comprises an air supply chamber communicating with the air distribution manifold, start-up and operational heating means positioned in the path of air passing from the air supply chamber to the air distribution manifold, the start-up heating means comprising means for heating air until the heating chamber has reached an operational temperature, and the operational heating means comprising means for heating air until the heating chamber has reached said operational temperature and for intermittently heating air thereafter to maintain the heating chamber at an operational temperature.

98. (New claim) The biological reaction apparatus of claim 97, wherein the heating device includes a fan positioned to force air into the air distribution manifold through the air supply chamber, said fan including air temperature responsive means for increasing the rotational speed of said fan when the air temperature entering the air distribution manifold falls below a desired operational temperature.

99. (New claim) The biological reaction apparatus of claim 96, further comprising a temperature sensing device positioned in the path of heated air entering the air distribution manifold for detecting the temperature of said heated air.

100. (New claim) The biological reaction apparatus of claim 99, wherein the temperature sensing device is a thermistor encased in a heat sensitivity reducing jacket.

101. (New claim) The biological reaction apparatus of claim 72, further comprising a rinse station, a rinse solution applicator positioned adjacent the rinse station, the rinse solution applicator comprising at least one nozzle positioned for directing a stream of rinse liquid onto a rinse solution impact zone of a sample support.

102. (New claim) The biological reaction apparatus of claim 72, further comprising an evaporation inhibiting liquid application station, evaporation inhibiting liquid applicator positioned adjacent the application station, the evaporation inhibiting liquid applicator comprising at least one nozzle positioned for directing a stream of evaporation inhibiting liquid onto a preselected evaporation inhibiting liquid impact zone of a sample support.

103. (New claim) An automated biological reaction apparatus of claim 102, wherein the evaporation inhibiting liquid application station is in the reagent delivery zone.

104. (New claim) The biological reaction apparatus of claim 72, wherein the air mixer includes a vortex agitation mixer having a nozzle for directing air at the air agitation zone, said sample support being positionable in the air agitation zone.

101.37169.050202



105. (New claim) The biological reaction apparatus of claim 104, wherein the vortex agitation mixer comprises a nozzle for applying at least one gas stream to an off-center area of the surface of liquid on a slide in the air agitation zone.

106. (New claim) The biological reaction apparatus of claim 105, wherein the vortex agitation mixer comprises a first nozzle adjacent to a distal end of a slide support in the air agitation zone for directing a first gas stream to a first off-center area of the surface of the liquid on a slide in the air agitation zone, and a second nozzle adjacent to a proximal end of a slide support in the air agitation zone for directing a second gas stream to a second off-center area of the surface of the liquid on a slide in the air agitation zone, the first and second gas streams being in opposite directions and the first and second off-center areas being on opposite sides of the center of the surface of a liquid on a slide in the air agitation zone.

107. (New claim) The biological reaction apparatus of claim 72, further comprising apparatus for providing a sample rinse liquid within a selected temperature range, such apparatus comprising:

a container for receiving liquid;  
temperature regulator, operatively mounted on said container, for maintaining liquid in the container within a selected temperature range; and  
means, operatively coupled to said container, for delivering liquid at a temperature within said selected temperature range from the container to said sample.

108. (New claim) The biological reaction apparatus of claim 107, further comprising a safety thermostat connected to the heating device for terminating a flow of power to the heating device if the temperature of the container exceeds a predetermined safety limit.

109. (New claim) The biological reaction apparatus of claim 94, further comprising a bar code cleaner for cleaning bar codes on the slides.

110. (New claim) The biological reaction apparatus of claim 108, further comprising draining means for draining rinse solution from a sample.

111. (New claim) The biological reaction apparatus of claim 110, characterised in that the drain means comprises a jet drain for directing a jet of fluid across an upper surface of a slide.

112. (New claim) The biological reaction apparatus of claim 108, wherein the rinse solution applicator comprises a first rinsing means at a beginning of the rinse zone and a second rinsing means at an end of the rinse zone.

113. (New claim) The biological reaction apparatus of claim 112, wherein the first rinsing means includes at least one nozzle for depositing a layer of rinse liquid onto an upper surface of a slide positioned at the beginning of the rinse zone and the second rinsing means includes sweeping means for sweeping the layer of rinse liquid off of the slide when the slide reaches the end of the rinse zone.

114. (New claim) The biological reaction apparatus of claim 113, wherein the first rinsing means and the second rinsing means are spaced from one another so that a predetermined period of time transpires during the transport of the slide between the first and second rinsing means before the layer of rinse liquid is swept off of the slide.

115. (New claim) The biological reaction apparatus of claim 114, wherein the sweeping means of the second rinsing means comprises fluid pulsing means for forming pulsed streams of rinse liquid, alternately directed at one and then an other of longitudinal edges of the slides, to sweep the layer of rinse liquid off of the slide.

202050-69T/ETOT